Chapter 2.3. Statewide River and Stream Water Quality Assessment

2.3.1 Introduction

Water quality monitoring conducted as part of the Section 305(b) report form the basis of the Division of Water Quality's assessment work. As part of this assessment, the State uses a five-year rotating monitoring program to collect data and to assess the beneficial use support of its rivers and streams. The State has been divided into ten watershed management units (Figure 2.3-1) and aggregated into five monitoring regions (Table 2.3-1). Each region is monitored on an intensive basis once every five years.

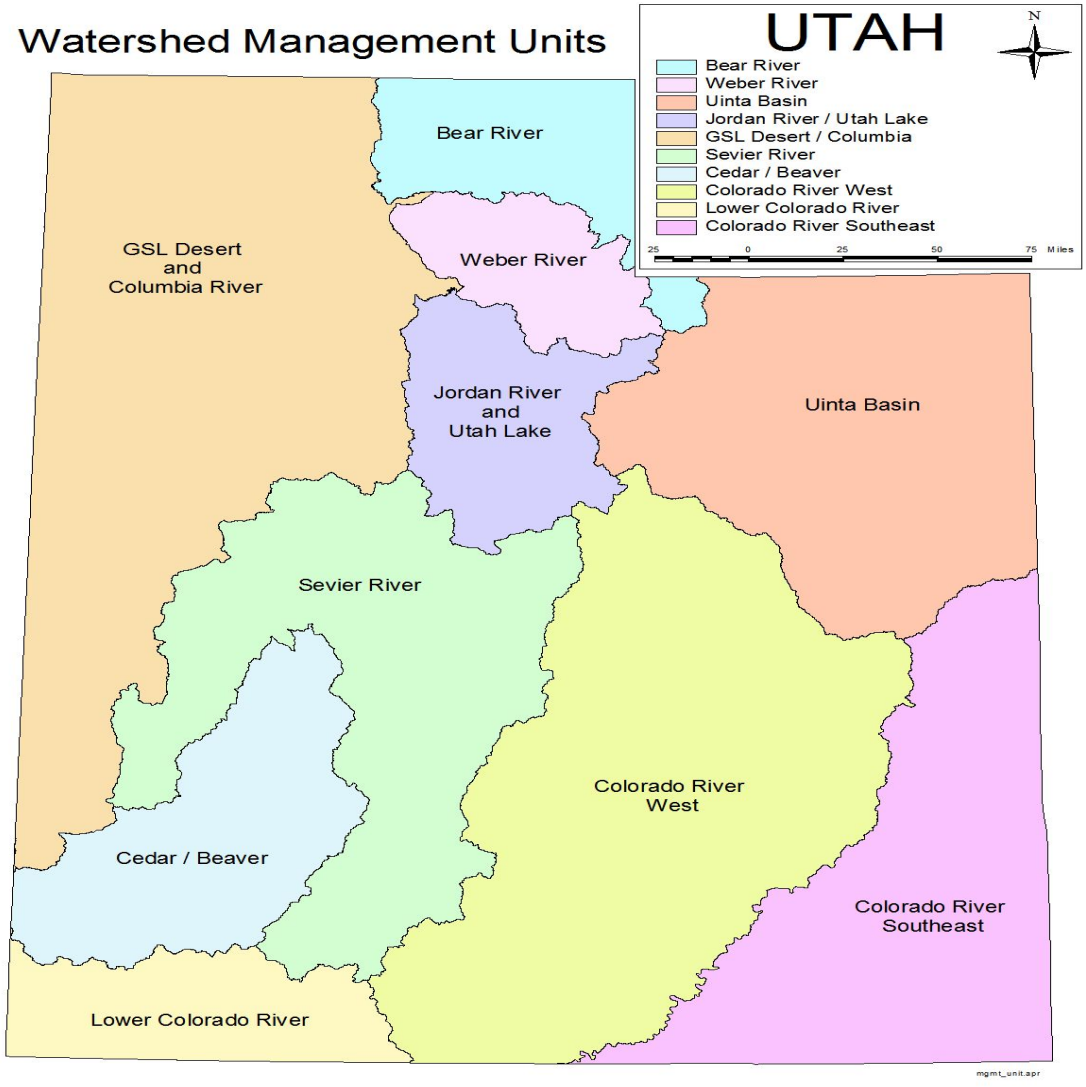

Figure 2.3-1 Watershed Management Units

Table 2.3-1 Water Quality Monitoring Regions

Region	Management Units
1	Bear River, Weber River, Great Salt Lake Desert/Columbia (northern portion of the GSL Desert)
2	Jordan River, Great Salt Lake Desert (southern portion of Great Salt Lake)
3	Uinta
4	Sevier River, Cedar/Beaver, Lower Colorado
5	Colorado River West, Colorado River Southeast

For this assessment cycle, data from intensive monitoring, program monitoring, cooperative monitoring the statewide assessment consists of the summary evaluations of intensive monitoring surveys for three watershed management units. These watersheds were the Sevier River, Cedar / Beaver and Lower Colorado Watershed Management Units.

Use support of beneficial uses was arrived at using chemical, physical, biological data and other information collected by the DWQ, Cooperating Agencies, and other entities involved in collecting data related to water quality. Federal and other public agencies involved with cooperative monitoring agreements or providing information used during this cycle to assess beneficial use support are listed below:

1. United States Forest Service
2. United States Bureau of Land Management
3. Salt Lake City
4. United States National Park Service
5. Central Utah Water Conservancy District.
6. United States Geological Survey
7. Salt Lake County
8. Provo River Watershed Council

Bacteriological data collected by Salt Lake City were used to assess streams in the Jordan River watershed. Bacteriological data provided by Salt Lake County were used to assess Emigration Creek and the Jordan River.

2.3.2 Statewide Assessment Results

2.3.2.1 Assessment for Mercury in Fish Tissue

Fish consumption advisories were placed on four Assessment Units (Table 2.3-2). These AUs were not listed on the 303(d) list as being impaired for mercury. They exceeded the Environmental Protection Agency's level of 3 mg/kg, or 0.3 ug/g, but none of the concentrations exceeded the United States Food and Drug Administration (FDA) value of 1.0 mg/kg. If any fish consumption advisory exceeds the FDA's standard, the AU will be listed on the 303(d) list.

Table 2.3-2 Stream Assessment Units that have Fish Consumption Advisories

Assessment Unit ID	Assessment Unit Name	Assessment Unit Description	Beneficial Use Class	Common Name Of Fish
UT14070005-007	Calf Creek	Calf Creek from confluence w/Escalante River to headwaters	3A	Brown Trout
UT16020102-022	Weber River-6	Weber River between East Canyon Creek confluence and Lost Creek confluence	3A	Brown Trout
UT14060005-009	Green River-3	Green River from HUC unit boundary (Price River confluence to Duchesne River confluence.	3B	Channel Catfish
UT14030005-005	Mill Creek-1	Mill Creek and tributaries from confluence with Colorado River to U.S.F.S. boundary	3A	Brown Trout

Statewide assessment of streams for at least one beneficial use came to 11,076 miles for this 305(b) reporting period. This was 77.7% of the perennial stream miles in the state.

2.3.2.2 Assessment by Category

Table 2.3-3 lists the number of stream miles assigned to the various assessment categories: Category 1, 2, 3A, 3B, 3C, 4A, 4B, 4C, and 5. The statewide beneficial use assessment by category is mapped in Figure 2.3-4. The stream miles assigned to each assessment category are graphed in Figure 2.3-2. Assessment Units assigned to each assessment category are listed in the tables in Appendix 2.1.

Table 2.3-3 Stream Miles by Assessment Category – State Wide

Category	Category Definitions	Stream Miles
1	All beneficial uses fully supported.	47.3
2	Assessed beneficial uses fully supported.	8,053.8
3A	No data or insufficient data to make an assessment.	2,161.5
3B	Lakes that are not supported for one cycle only.	
3C	Insufficient data to assess but an assessment plan is in place.	0.0
4A	Approved TMDL	1,383.9
4B	Pollution control requirements are expected to result in full beneficial use support in near future.	0.0
4C	Impaired by pollution, no TMDL required.	531.2
5	Impaired by pollutant, TMDL required.	1,825.3

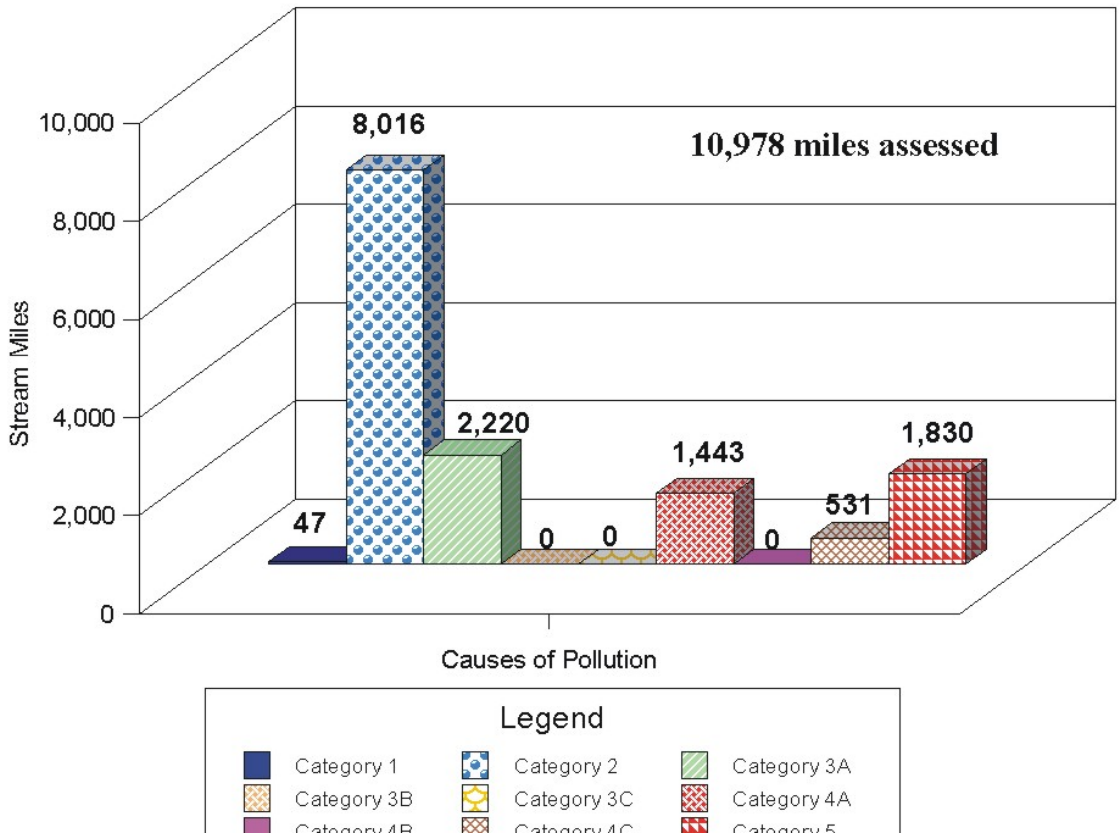

Figure 2.3-2 Stream miles assessed in various beneficial use assessment categories

2.3.2.3 Overall Use Support

Of the 11,076 stream miles assessed, 8,101.1 miles (73.1%) are fully supporting and 2,974.7 (26.9%) stream miles are impaired for at least one beneficial use (Figure 2.3-3). For the majority of streams, the Class 2B (protected for contact recreation) was not assessed because bacteriological data were not

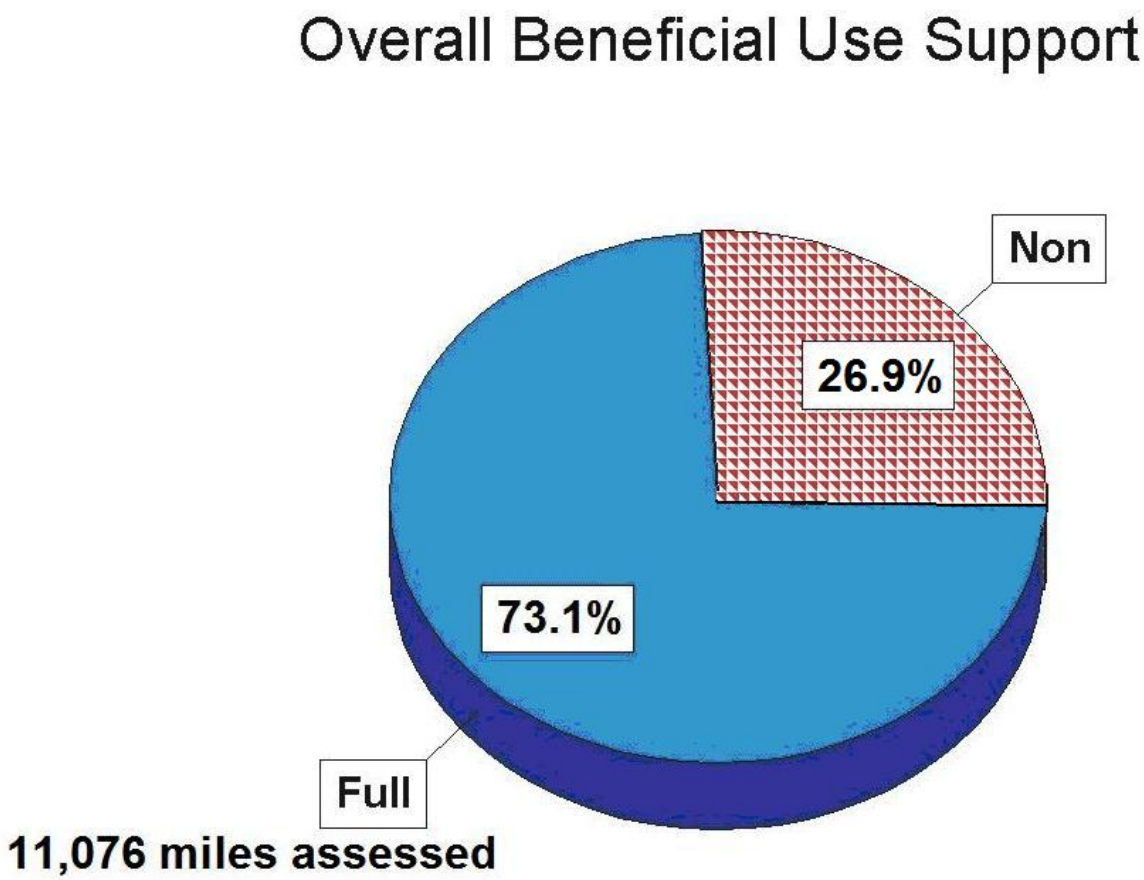

Figure 2.3-3 Statewide overall beneficial use support assessment for streams

available. Waters with this classification were only considered assessed if bacteriological data were collected unless there was physical or chemical impairment such as pH.

2.3.2.4 Individual Beneficial Use Support

Use support by individual beneficial use designations is summarized in Table 2.3-4 The aquatic life use was assessed for 10,514.8 miles of streams. Of these stream miles, 8,112.5 (77.2%) were supporting and 2,402.3 (22.8%) are not supporting this beneficial use. No streams were assessed for Swimming (Primary Recreation) beneficial use. Secondary recreation was assessed on 279.9 miles. Of these 170.1 (60.8%) miles were supporting and 109.8 (39.2%) were not supporting secondary recreation beneficial use. The agricultural beneficial use support for 10,062.3 stream miles was assessed. Of these, 9,021.2 (89.7%) were supporting and 1,041.1 (10.3%) were not supporting the agriculture beneficial use. Of 4,158.6 stream miles assessed for drinking water beneficial use, 4,013.5 (96.5%) miles were supporting and 145.1 miles were not supporting. An assessment for 4,201.3 waters classified as potential source of drinking water was made.

Of these, 4,056.2 (96.5%) are supporting and 992.0 (3.5%) are not supporting this beneficial use.

Table 2.3-4 Individual Use Support Summary

	Size Assessed	Size Fully Supporting	Size Not Supporting	Totals
Use				
Drinking Water	4,158.6	4,013.5	145.1	4,158.6
Fish Consumption	0.0	0.0	0.0	0.0
Swimming	0.0	0.0	0.0	0.0
Secondary Contact	279.9	170.1	109.8	279.9
Aquatic Life	10,514.8	8,112.5	2,402.3	10,514.8
Agricultural	10,062.3	9,021.2	1041.1	10,062.3
Use				
Drinking Water		96.5%	3.5%	100.0%
Fish Consumption		0.0%	0.0%	0.0%
Swimming		0.0%	0.0%	0.0%
Secondary Contact		60.8%	39.2%	100.0%
Aquatic Life		77.2%	22.8%	100.0%
Agricultural		89.7%	10.3%	100.0%

2.3.2.5 Causes of Not Supporting

Stream miles impacted by specific cause categories are summarized in Table 2.3-5. Stream segments may have been impacted by multiple causes. The primary causes of impairment were metals (5.9%), nutrients (7.7%), sediment (5.0%), temperature (7.6%), habitat alterations (4.7%), total dissolved solids (7.5%), benthic macroinvertebrate community impairment (8.1%) The percent stream miles affected by sources are graphed in Figure 2.3-4 and the relative percent contribution of each cause is shown in Figure 2.3-5.

2.3.2.6 Sources of Not Supporting

The sources of stream water quality impairment are summarized in Table 2.3-7. Like causes, stream segments may have been impacted by multiple sources. The primary sources of impairment were agricultural practices (23.3%), natural sources (15.2%) hydrological modification (12.8%), habitat modification (5.2%) ,and unknown sources (23.5%) (Figure 2.3-7). The relative percent contribution of each source to the impairment of streams is shown in Figure 2.3-8.

Table 2.3-4. The percentages of streams that were assessed using only chemical/physical data and those that were assessed using chemical/physical, habitat and biological data to determine aquatic life uses.

Table 2.3-5 Categories of Data Used in ALUS Assessments for Wadeable Streams and Rivers

Degree of ALUS	Miles Assessed Based on B/H Data Only	Miles Assessed Based on P/C Data Only	Miles Assessed Based on B/H and P/C Data	Total Miles Assessed for ALUS
Fully Supporting	114.9	4,456.1	3,380.4	7,951.4
Fully Supporting but Threatened		-	-	-
Not Supporting	16.40	2,096.7	979.5	3,092.6

Table 2.3-6 Total Waters Imparied by Various Cause Categories (Stream Miles)

Cause Category	Miles Impacted
Benthic macroinvertebrate assessment impairment	520.49
E. coli	25.01
Flow Alteration	96.67
Metals	540.2
Organic Enrichment/Low DO	87.62
Other Habitat Alterations	511.6
pH	87.85
Radiation	21.79
Salinity/TDS/Chlorides	848.58
Siltation	518.64
Temperature	714.58
Total Phosphorus	849.85
Unionized Ammonia	7.36

Table 2.3-7 Total Waters Impaired by Various Source Categories (Stream Miles)

Table 2.3-7. Total Waters Impaired by Various Source Categories (Steam Miles)	
Source Category	**Miles Impacted**
Agriculture	1,602.8
Aquaculture	75.5
Construction	34.7
Drought	238.7
Habitat Modification (other than Hydromodification)	579.6
Hydromodification	840.6
Industrial Point Sources	119.4
Land Development	34.7
Major Municipal Point Source	34.7
Municipal Point Sources	154.0
Natural Sources	1,021.0
Resource Extraction	201.6
Source Unknown	1,237.5
Sources outside State Jurisdiction or Borders	136.2
Urban Runoff/Storm Sewers	157.1

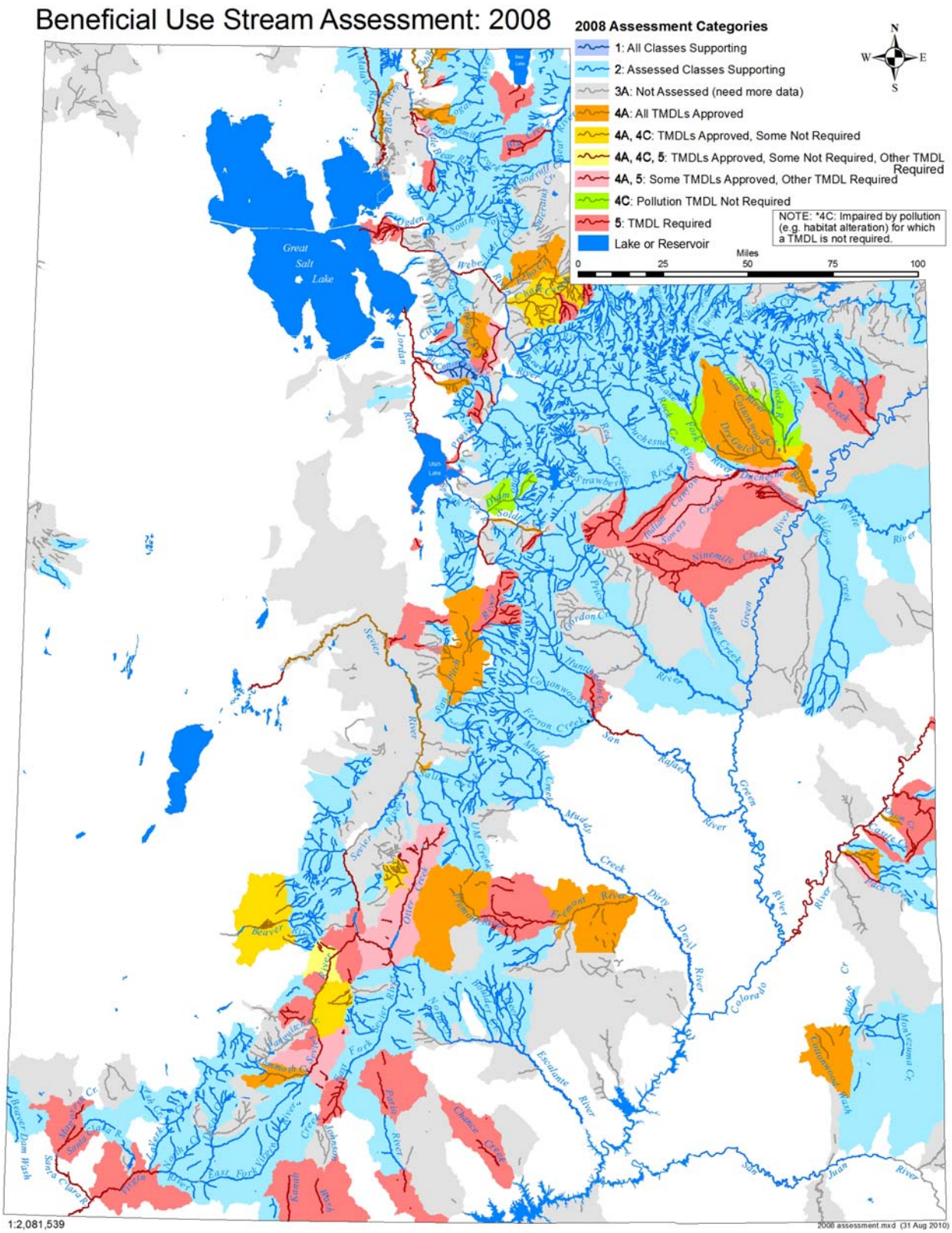

Figure 2.3-4 Statewide beneficial use assessment by categories

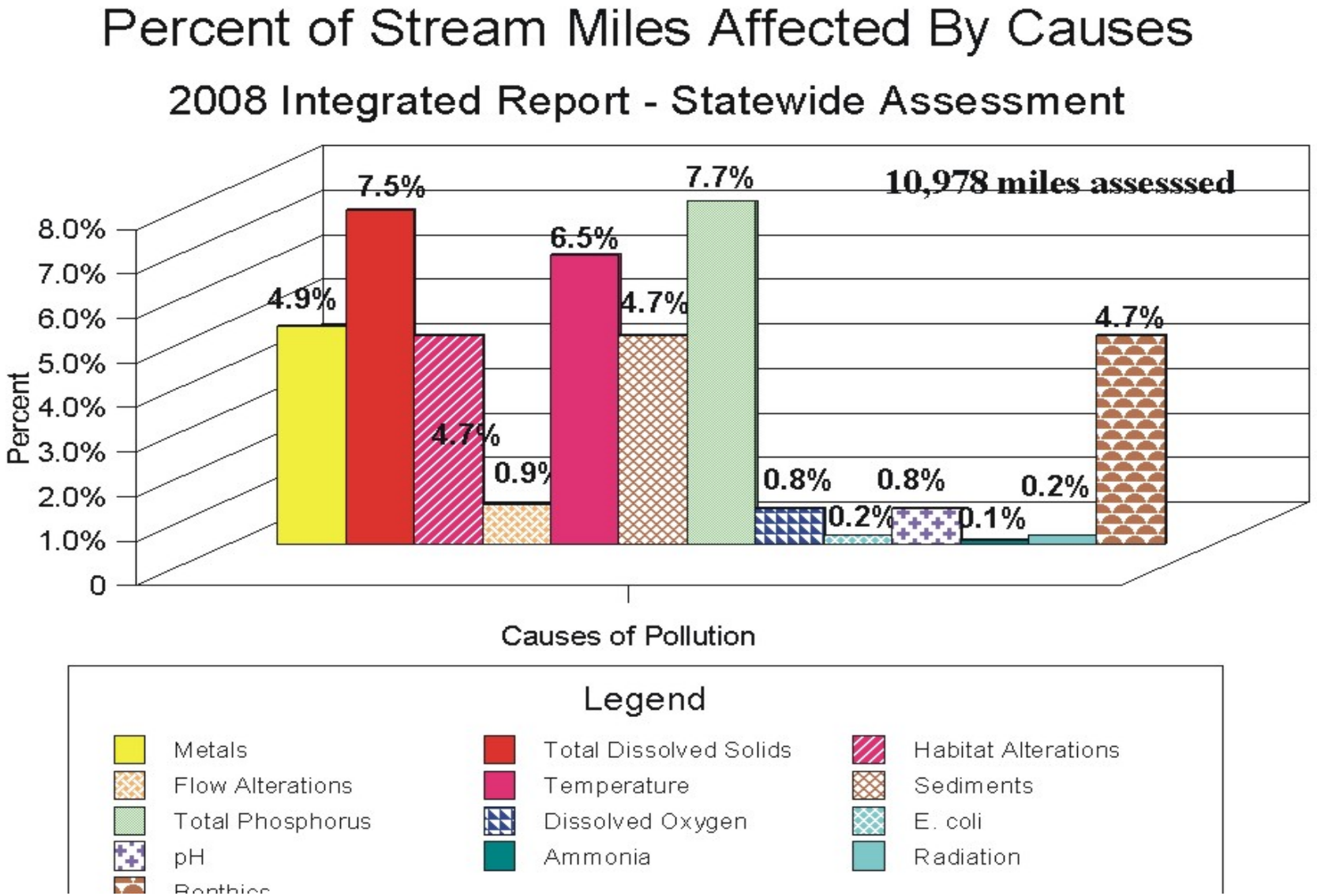

Figure 2.3-5 Percent of assessed stream miles impacted by various causes – Statewide Assessment

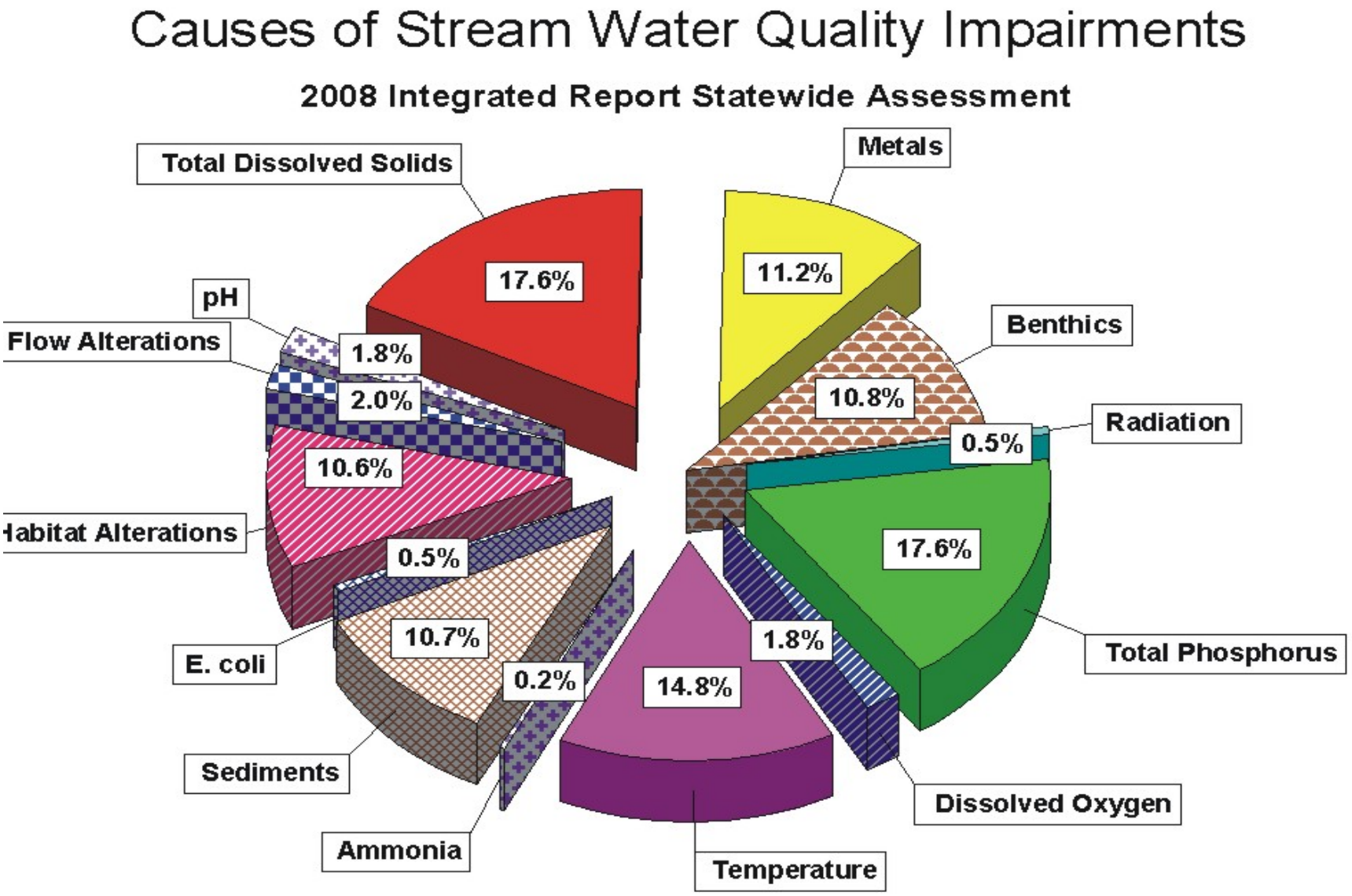

Figure 2.3-6 Relative percent contribution of causes on stream water quality – 2008 Integrated Report

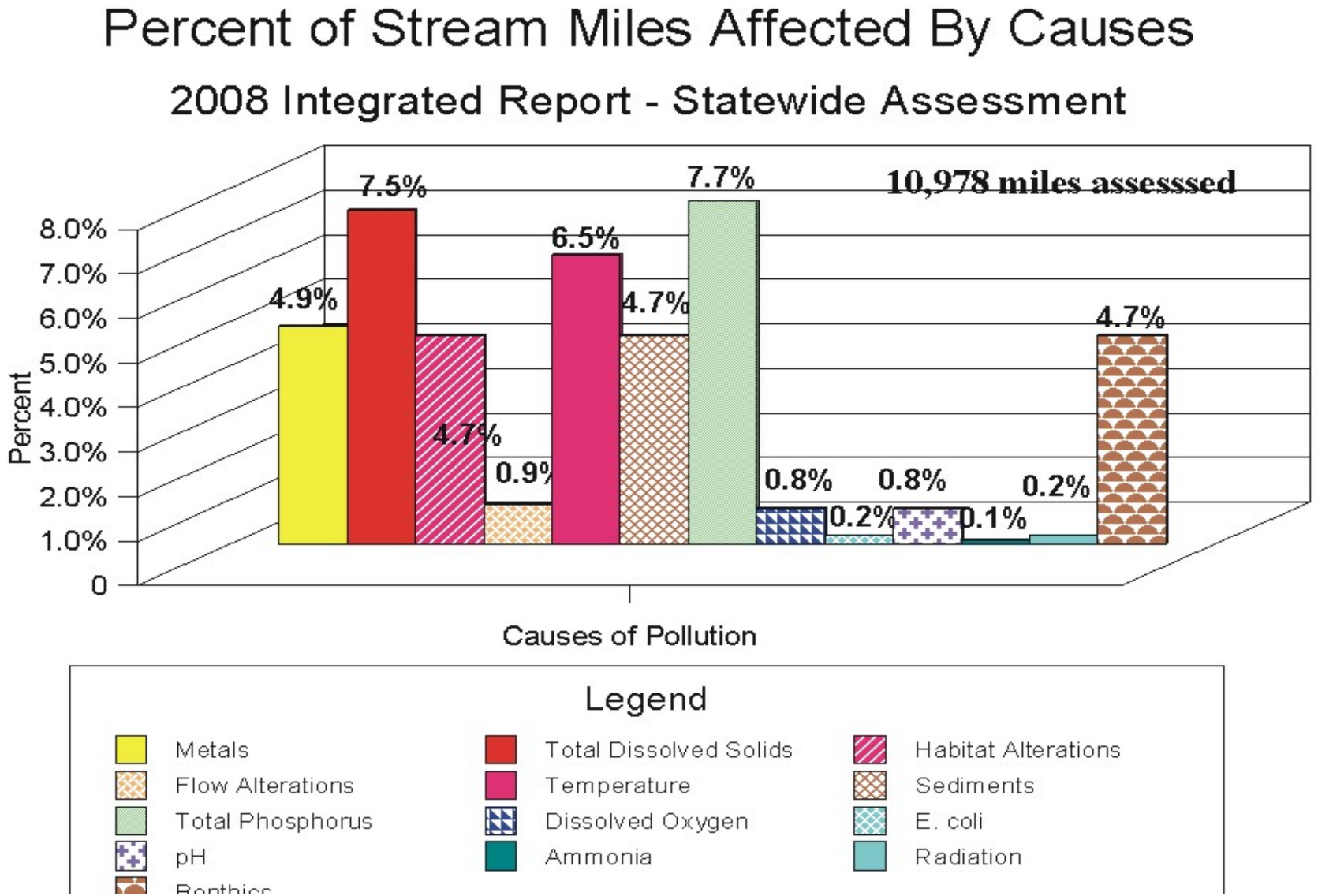

Figure 2.3-7 Percent impact by sources on stream water quality – 2008 Integrated Report

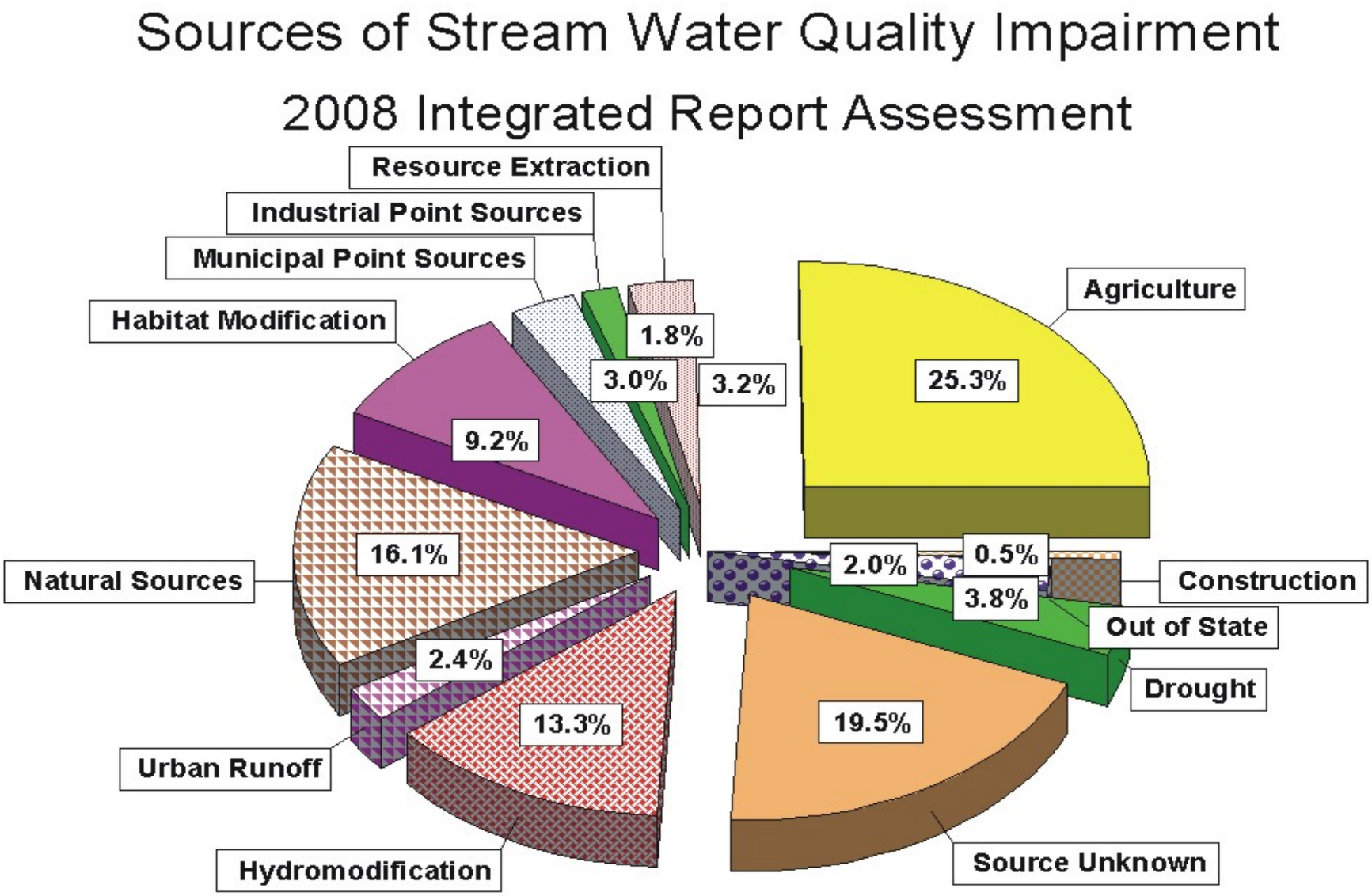

Figure 2.3-8 Relative percent contribution of sources on stream water quality